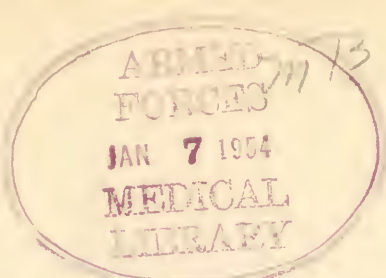
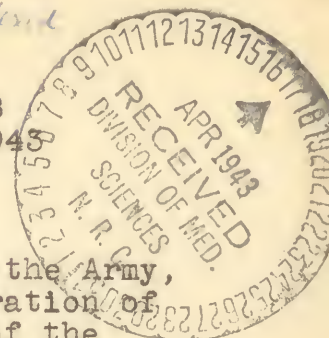


W2
A2
S9L



Letter No. 8
April 16, 1943



Dear Doctor:

This letter is sent to you by the Surgeon Generals of the Army, Navy, and the U.S. Public Health Service, with the cooperation of the American Medical Association and under the auspices of the Committee on Information of the Division of Medical Sciences of the National Research Council.

In a letter to The Journal of the American Medical Association, Dr. M.G. Seelig, Director of Pathology, Barnard Free Skin and Cancer Hospital, emphasizes the danger of talcum in the abdominal cavity. Talcum is predominantly magnesium silicate. It sets up a vicious reactionary adhesive peritonitis. Talcum gets into the abdominal cavity when shed from the surface of rubber gloves or from cracks or when it is spilled accidentally from inside the gloves. Experiments in the Barnard Free Skin and Cancer Hospital have reached the point which permits the statement that ordinary cornstarch serves as an ideal dusting powder, does not cause undesirable after-effects, and is sterilized by ordinary autoclaving. (J.A.M.A. 121:1304 - April 17, 1943)

To determine the average time required for hemoglobin to return to its original level in blood donors, Barer and Fowler gave iron salt to 89 donors after their second blood donation. The rate of hemoglobin regeneration was increased by 49 per cent. The recovery period was shortened to 35.2 days in comparison with 49.6 days after the first donation without therapy. There was no evidence of bone marrow exhaustion after repeated donations. (Amer. Journal of Med. Sciences, 205:9 - Jan. 1943)

A review on "The Role of Vitamin Concentrates in War and in Post-War Food Relief in Europe," appears in Nutrition Abstracts and Reviews for January, 1943. Dr. V.P. Sydenstricker says that the nutrition of the personnel of the armed forces and of workers will be maintained at the optimum level, also that of young children and pregnant women. It has been suggested that an abundance of vitamins or an excess above the amounts considered optimal in normal nutrition may produce unusual stamina, or at least enable men to endure excessive and prolonged effort. Careful studies indicate that any improved performance reported after such feedings would be accounted for by the readily available calories of the supplement.

In our present state of knowledge, decreased efficiency due to fatigue is best controlled by extra meals of high caloric value taken during working hours. These should consist of palatably prepared natural foods rather than sweets or sweetened drinks in which sugar is the sole source of energy.

Syndenstricker emphasizes the opinion of Bourne that, "It is probable that at the end of this war the following dietary deficiencies will occur to a greater or lesser degree on the continent of Europe: (1) absolute lack of food; (2) deficiency of protein; (3) deficiency of vitamin D; (4) deficiency of vitamin A; (5) deficiency of vitamin C; (6) deficiency of riboflavin; (7) deficiency of calcium." (Nutrition Abstracts and Reviews, 12:339, Jan. 1943)

The July & October (1942) issue of the Journal of Neurology and Psychiatry of Great Britain has just become available. It contains an excellent series of articles on factors affecting recovery of functions after nerve lesions. E. Gutmann and his colleagues from the Department of Zoology and Comparative Anatomy in Oxford say that a good test of the time and degree of functional regeneration of nerve is provided by a study of the recovery of the function of spreading of the toes of the rabbit, following lesions of the peroneal nerve. They report that the circumference of the denervated muscle begins to increase, and its threshold to direct stimulation to decrease, before reflex function, and sometimes before even indirect excitability return. Fibrillations continue in the muscles for about two weeks after reappearance of reflex function.

The normal weight of the muscle is nearly regained twelve weeks after reappearance of reflex function following crushing of the peroneal nerve. Recovery in the autonomous zone of a nerve due to regeneration of the interrupted nerve proceeds in general in a downward direction. The nature of the lesion is of decisive importance for time and degree of recovery. After suturing recovery is slower, more irregular, and the degree of recovery is definitely less than after crushing. (The Journal of Neurology and Psychiatry, 5:81 and 117 July-Oct. 1942)

In a study of the swelling of human limbs in response to immersion in cold water, T. Lewis, writing in Clinical Science, London, Dec. 15, 1942, page 349, found that the routine cooling of human hands and feet by their immersion in water at 41° F. causes the extremities to swell. This increase in their volume occurs in both the cutaneous and subcutaneous tissue and may amount within three hours to as much as 15 per cent of the original volume. The swelling is due mainly to an edema of the tissues, judged to be inflammatory from its relatively rapid outpouring and from its relatively high content of protein. The contribution in the form of imbibed water is slight. The edema that results from long continued immersion of the limbs in cold water should be taken into account, as should protein loss, when the effects of exposure to cold on the whole circulation are estimated.

Samuel A. Guttman tells in the Archives of Neurology and Psychiatry for April 1943, page 556, about the treatment of post-lumbar-puncture headache with ergotamine tartrate. It was found that the drug was of value for the purpose in eight to nine tenths of the patients only when the drug is administered according to the tolerance of the patient for the drug. Each person differs in this respect. The dose for a particular patient is the amount of the drug which gives the desired therapeutic effect. In the experiment concerned ergotamine tartrate was administered by the intravenous route to eight persons. Each person received 1 cc. of physiologic solution of sodium chloride by vein about two hours before ergotamine tartrate was administered. In no instance was relief afforded by such injection. After injection of 0.25-0.50 mg. of ergotamine tartrate by vein the patients reported beginning relief from the headache in fifteen to thirty minutes. These patients were usually made to sit up each five to ten minutes, and by the end of a half-hour the headache was entirely gone or greatly diminished in intensity.

Studies made by Kurt Lange, Department of Medicine, New York Medical College, indicate that the capillaries of the skin of man and experimental animals, when exposed to cold (10° C.) for 10 minutes show a marked decrease of permeability. The permeability was tested by the use of fluorescein under long-wave ultraviolet light. In the cooled area there is a marked dilatation of the capillaries. Amyl nitrite increases capillary permeability in the skin but not in the cooled area. This decrease in capillary permeability in cooled skin cannot be demonstrated in the capillaries of the mesentery or intestine. ("The Effect of Cold on Capillary Permeability," Bulletin New York Medical College, Flower and Fifth Avenue Hospitals, Dec. 1942, page 154)

In a review of problems of aviation medicine, Ross A. McFarland, Assistant Professor of Industrial Research at Harvard University, and Consultant, Pan-American Airways System, says:

With the rapid ascents of fighting aircraft to heights of 30,000 feet in 8 to 15 minutes, the problem of aeroembolism and maintenance of fitness at high altitudes is tremendously important. The barometric pressure at that height is roughly 220 mm. Hg. as compared with 760 at sea level. In too rapid an ascent, nitrogen bubbles are liberated from the tissues and a syndrome of extreme pain particularly in the joints occurs which is similar to the "bends" of caisson workers. This occurs even when the flyer is breathing pure oxygen during the entire ascent. Experiments have now shown that much of the nitrogen can be removed from the body before the ascent by a period of exercise while breathing pure

oxygen before the crew boards the plane. This often combats the incapacitating nitrogen-bubble formation.

Under standard atmospheric conditions, the temperature at 33,000 feet is -55° (F.). In spite of clothing and heating systems, the pilot and gunner cannot be exposed to this intense cold for long periods without lowering the body temperature and giving rise to slow and inaccurate motor performance with gravely impaired cerebral and mental activities.

In addition, an aircraft, whether pulling out of a dive or executing a tight turn, will have acting on it an acceleration called "centrifugal force." At a centrifugal acceleration of seven times the force of gravity, a pilot weighing 170 pounds would weigh 1190 pounds and his blood "becomes as heavy as molten iron." During such acceleration, the weight of the hydrostatic column of blood is too great for the heart on the arterial side and venous blood fails to be returned to the heart from regions below the cardiac level. The blood tends to pool in the abdomen and lower extremities, and failure of the cerebral circulation occurs. The occipital or visual areas are first affected, giving rise to a dimming of the vision or "blackout." Although the pilot's vision may be seriously impaired, he is aware of what is happening, and pulls out of the dive. Each pilot knows his limit and these limits vary greatly.

The most desirable diet for the airman previous to or during flight is one of high caloric value which is easily assimilated. Carbohydrates are highly recommended while green vegetables and cellulose-containing foods are restricted. At 18,000 feet the gases in the digestive organs expand to double their volume. This may lead to unpleasant pressure on the abdominal wall and diaphragm. Additional factors contributing to pilot fatigue are lack of exercise, reduced tension of oxygen encountered in flight at high altitudes, poor selection of food and excessive use of alcohol and tobacco. Moreover, certain variables related to the cockpit of the plane are important. These include noise, vibration, poor illumination, glare, radio static, poor regulation of ventilation and of temperature. (Bulletin of the New England Medical Center, February 1943, page 1)

Holt and his coworkers reported in the Proceedings of the Society for Experimental Biology and Medicine in 1941 on the effect of single amino acid deficiencies in human beings. Tryptophane is a dietary essential for human beings without which nitrogen equilibrium cannot be attained. Lysine also was demonstrated to be essential for the maintenance of nitrogen equilibrium. A deficiency of arginine reduced the sperm count in three male subjects to one-tenth of normal. These tissues have a high content of arginine. It is said that for purposes of serum protein regeneration positive nitrogen balance and general intravenous alimentation, individual amino acids will not serve the purpose. It is not desired to imply,

however, that therapy with specific amino acids is an illogical or improbable procedure. The value of therapy with single amino acids was demonstrated by Rabinowitz, who showed the effectiveness of methionine in controlling spontaneous bleeding in the acute form of essential thrombocytopenic purpura. The field of intravenous alimentation with amino acid preparations, according to Gustav J. Martin and Marvin R. Thompson, offers tremendous potentialities for clinical research. ("Intravenous Alimentation with Amino Acids," Medicine, Feb. 1943, page 73)
